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Documents Sent to Jim Costello (EPA Senior Attorney)
and Cynthia Brown (EPA Removal Enforcement Coordinator), February 2009

Re: New Mexico National Guard Liability at Walnut and Griggs Ground Water Plume

Interview Transcript		
Date	**Document**	**Primary Relevance**
January 12, 2009	Transcription of interview conducted by Ed Fridenstine (Doña Ana County) of former National Guardsman Casimiro Gonzales - Mr, Gonzales was stationed at Solano and Hadley Armory (the "Solano armory") in Las Cruces, Mobilization and Training Equipment Site, from 1965-68 and 1971-73. - Former positions/ranks: maintenance mechanic, ordnance branch, National Guard State Organizational Maintenance Officer, Captain, Lieutenant Colonel.	- Mr. Gonzales reports the use of dry cleaning solvent for M42 maintenance at the armory. *See* Transcript ("TR") page 8. - Reports use of dry cleaning solvent in wash racks at Solano armory in one and possible five and 55-gallon drums. TR pp. 8-11. - Reports use of dry cleaning solvent by mechanics in vats inside armory maintenance bays, and disposal of solvents into sumps. TR pp. 8, 11. - Reports use of dry cleaning solvent on gun barrels and spraying engines and tracks down with dry cleaning solvent through air-compressed spray guns. Solvent was sprayed onto equipment on the outdoor steam rack next to armory. Solvents drained onto concrete and into a sump. From there, solvents drained to the ground or, potentially, the sewage system. (Mr. Gonzales was not certain whether the sump was connected to the sewer or not.) TR pp. 6-8, 10. - Reports operating according to the Department of the Army TM 9-2910-213-34&P, Direct Support and General Support Maintenance Manual for pump, Fuel, Engine, Assembly (December 1985), which required the use of dry cleaning solvent P-D-680, Type II (81348). TR page 9. (*See* pages 3-2 and C-1 of TM 9-2910-213-34&P) - Confirmed use of dry cleaning solvent, per operator's manual portion of Department of the Army Technical Manual ("TM") 9-7218, Twin 40-MM Full Tracked Self-Propelled Gun M42 (T141). TR p. 5.

Military and Federal Specifications

P-D-680 Series Governing Dry Cleaning Solvent

The P-D-680 series of specifications were incorporated by M42 operation and maintenance manuals (also listed below) that required the use of dry cleaning solvent or minerals spirits paint thinner for various tasks.

According to every M42 manual that we have located, all M42 components required cleaning with dry cleaning solvent or mineral spirits paint thinner. The former National Guard personnel who the City and County have interviewed recall using dry cleaning solvent for this purpose. Some specifications call for the use of the P-D-680 series of dry cleaning solvent. Other specifications do not. These specifications could have instead required, for example, the use of O-T-236C or its precursors, governing drycleaning grade tetrachloroethylene. (The earliest version of O-T-236 that we have found so far, issued on August 6, 1979, is provided as an example in the "1970s specifications" folder). We are continuing to research this question.

As specifications became more sophisticated, they contained more information and detail. For example, the first table in MIL-PRF-680 (December 13, 1999), MIL-PRF-680A (July 25, 2003), and MIL-PRF-680B (Oct. 26, 2006), provides for tetrachloroethylene as a constituent of each type of solvent governed by the various specifications. Allowable constituents were not listed on relevant specifications issued before the late 1980s.

According to the specifications that we have located for this substance, the physical and chemical properties of "dry cleaning solvent" governed by the P-D-680 series remained largely the same over the years. For example, the initial boiling point set forth in all available specifications (issued in 1963, 1988, 1999, 2003, and 2006) is 149 degrees Celsius for type I, and 177 degrees Celsius for type II. The dry point is between 208 and 210 degrees Celsius for type I, and between 211 and 212.7 degrees Celsius for type II. Similarly, the flash point for the P-D-680 substance, as constituted between 1963 and 2006, was between 38 and 60 for type I, and between 60 and 92 for type II.

Date	Document	Primary Relevance
March 27, 1963	Federal Specification P-D-680, Dry Cleaning Solvent (superseding Int. Fed. Spec. P-S-99661c (GSA-PSS) June 1, 1962 and Fed. Spec. P-S-661b (April 6, 1958)	Governs two types of petroleum distillates employed for dry cleaning of textile materials, referred to industrially as "Stoddard Solvent" and "140 degree Solvent."

September 9, 1988	Federal Specification P-D-680A, Dry Cleaning and Degreasing Solvent (superseding Federal Specification P-D-680, Dry Cleaning Solvent (March 27, 1963))	Governs regular (Stoddard solvent, type I) and high flash point (type II), used for dry cleaning, spot and stain removing, and degreasing of machine parts in equipment maintenance. Allowable constituents include toluene, ethylbenzene, solvent with olefinic or cycloolefinic unsaturation, aromatic compounds, and branched chain ketones. *See* page 4.
December 13, 1999	Performance Specification MIL-PRF-680, Degreasing Solvent (superseding P-D-680B (Oct. 29, 1992)	Governs degreasing solvents types I-IV: Type I (low flash point Stoddard solvent); Type II (high flash point); Type III (very high flash point, 200 degrees F); and Type IV (high flash point with citrus odor). All are for degreasing of machine parts in equipment maintenance. All four provide for up to 0.5 mg/L of **tetrachloroethylene** as a chemical constituent. *See* pages 1, 5-6
July 25, 2003	Performance Specification MIL-PRF-680A, Degreasing Solvent (superseding MIL-PRF-680 (December 13, 1999)	Governs degreasing solvents types I-IV: Type I (low flash point Stoddard solvent); Type II (high flash point); Type III (very high flash point, 200 degrees F); and Type IV (high flash point with citrus odor). All are for degreasing of machine parts in equipment maintenance. All four also provide for up to 0.7 mg/L of **tetrachloroethylene** as a chemical constituent. *See* pages1; 5-6, tbl. I; 7, tbl. II.
Oct. 26, 2006	Performance Specification MIL-PRF-680B, Degreasing Solvent (superseding MIL-PRF-680A, Dec. 25, 2003) (superseding MIL-PRF-680A, December 25, 2003)	Governs degreasing solvents types I-IV: Type I (low flash point Stoddard solvent); Type II (high flash point); Type III (very high flash point, 200 degrees F); and Type IV (high flash point with citrus odor). All are for degreasing of machine parts. Also provides for up to 0.7 mg/L of **tetrachloroethylene** as a chemical constituent of types I-IV of solvent. See page 5, tbl. 1 and page 7, tbl. II.

1950s Specifications		
Date	**Document**	**Primary Relevance**
May 1952	Department of the Army Technical Manual 9-252, 40-MM Automatic Gun M1 40-MM, Antiaircraft Gun Carriage M2A1 and 40-MM Gun Mount M3	Requires use of dry cleaning solvent or volatile mineral sprits paint thinner for cleaning, care, and other maintenance of M42s. *See* Chapter 9.
May 1957	Department of the Army Technical Manual 9-7218, Twin 40-MM Full Tracked Self-Propelled Gun M42 (T141), including Lubrication Order ("LO") 9-7218, Gun, Self-Propelled, Full Tracked: Twin 40-mm, M42 and M42A1 (March 30, 1954) (*excerpt*).	Requires use of dry cleaning solvent or mineral spirits paint thinner for various maintenance functions.
June 10, 1957	Department of the Army Technical Bulletin 9-7218-1, Twin 40-MM Full Tracked Self-Propelled Gun M42A1: Operation and Organizational Maintenance Instructions for Peculiar Items (*excerpt*)	Requires use of dry cleaning solvent or mineral spirits paint thinner for cleaning and inspection of filter element and drive screen vent. *See* pages 14, 47. During disassembly, requires use of dry cleaning solvent or mineral spirits paint thinner for cleaning and inspection of "all parts" on M42s. *See* pages 42, 440.

1960s Specifications		
Date	**Document**	**Primary Relevance**
April 5, 1966	Military Specification MIL-G-45178A(MD) Gun, Self-Propelled, Full Tracked: Twin 40MM, M42 and M42A1; Preparation For Storage and Shipment Of.	Requires use of, among many other chemicals, MIL-C-16173 ("Corrosion Preventive Compound, Solvent Cutback, Cold-Application"), which, in turn, required the use of dry cleaning solvent conforming to P-D-680. **This specification calls for the use of various other substances containing unknown chemicals. See pages 1-2. We have requested several of the specifications governing those substances from, among other entities, the National Guard Bureau, Department of the Army, Army Publishing Directorate, and National Archives and Records Administration under FOIA, and from the New Mexico Department of Military Affairs under the New Mexico Public Records Act. We have yet to receive them, so do not yet know whether they contained PCE.*
October 20, 1966	Military Specification MIL-C-16173, Corrosion Preventive Compound, Solvent Cutback, Cold-Application	Mandated for use in preparation of M42s for storage and shipment by Military Specification MIL-G-45178A(MD) (April 5, 1966). Required use of a "dry cleaning solvent conforming to type I of P-D-680" for removability determination. *See* pages 1, 10 (section 4.6.7).
June 7, 1968	US Army Lubrication Order ("LO") 9-2350-202-12, Gun, Antiaircraft, Artillery, Self-Propelled: Twin 40MM, M42 and M42A1 (*excerpt*)	Requires use of dry cleaning solvent or mineral spirits paint thinner for parts cleaning on M42s. *See* page 1.

1970s Specifications		
Date	**Document**	**Primary Relevance**
February 24, 1975	Military Specification MIL-C-16555D, Coating Compound, Strippable, Sprayable.	Mandated for use in preparation of M42s for storage and shipment by Military Specification MIL-G-45178A(MD). Provided for use of volatile solvents and other hazardous substances detected at the Griggs and Walnut Ground Water Site. *See* pages 3 (coating compound compositions included between 66 and 70% volatile solvent content by weight), 6, 15 (solvent to consist of methyl ethyl ketone and/or toluene, with volatile stabilizers).
May 8, 1978	Federal Specification TT-T-291F, Thinner, Paint, Mineral Spirits, Regular and Odorless	- May have been used as a maintenance substance alternate to P-D-680 dry cleaning solvent for M42 and gun cleaning, per M42 manuals identified herein. - Provides for benzene, toluene, and additional hazardous substances detected at the Griggs and Walnut Ground Water Site as allowable chemical constituents of mineral spirits paint thinner. *See* page 3.
August 6, 1979	Federal Specification O-T-236C, Tetrachlroethylene (Perchloroethylene), Technical	Governs drycleaning grade and vapor degreasing grade tetrachlroethylene. **We are continuing to research earlier versions of this and related specifications to determine their applicability at the Solano armory.*

1980s Specifications		
Date	**Document**	**Primary Relevance**
November 1980	US Army ST 44-177-1, Operator and Maintenance Procedures for M42/M42A1 Twin 40-MM, Self-Propelled, Antiaircraft Gun (*excerpt*)	Requires use of drycleaning solvent or mineral spirits paint thinner for washing M42 oil filters. *See* pages 2-3.
March 1985	Department of the Army TM 9-2350-202-10, Operator and Maintenance Manual for Gun, Self-Propelled: Twin 40MM, M42 and M42A1	Requires use of dry cleaning solvent or mineral spirits paint thinner for engine fuel filter element cleaning. *See* page 3-43.
November 29, 1985	Military Specification MIL-D-45064D, Degreaser, Portable, Solvent Type, Tank Immersion	Provided as an example of the type of parts degreaser that may have been at the Solano armory, according to statements by Colonel Harold Uttley and Antonio Marta. Calls for drycleaning solvent P-D-680. *See* pages 1, 8.
December 1985	Department of the Army TM 9-2910-213-34&P, Direct Support and General Support Maintenance Manual for pump, Fuel, Engine, Assembly	Requires use of dry cleaning solvent P-D-680, Type II (81348) for fuel pump report. *See* pages 3-2 and C-1.

Material Safety Data Sheets		
According to the New Mexico Department of Military Affairs' September 17, 2004 CERCLA Section 104(e) response, "the solvents and degreasers" that the National Guard used at the Solano armory were "provided by the U.S. Army through the standard requisition and issue supply system and disposed of through contractors such as Safety Kleen . . . . " According to the Safety Kleen, Inc. legal department, Safety Kleen may have supplied and picked up solvent from at least one former National Guard facility in Las Cruces. (It is currently conducting a records search at the request of the City and County.) Therefore, Safety-Kleen products conforming to applicable military standards may have been used at the Solano armory. We have provided potentially applicable Safety Kleen Material Safety Data Sheets, and will supplement this information upon receipt of additional Material Safety Data Sheets (or equivalent historical information sheets) governing dry cleaning solvents and mineral spirits paint thinner during the relevant time period – approximately 1941-1990 – from Safety-Kleen and other sources.		
Date	**Document**	**Primary Relevance**
Nov. 27, 2002	Safety-Kleen 105 Solvent Recycled	This is the oldest specification governing the dry cleaning solvent that was likely used at the armory that we have been able to locate so far. The specification governs substances used for cleaning and degreasing metal parts. Synonyms: "Parts Washer Solvent; Petroleum Distillates; Petroleum Naptha; Naptha, Solvent; Stoddard Solvent; Mineral Spirits." These substances are similar or identical to those mandated for use in M42 and other equipment maintenance at the Solano armory – namely, dry cleaning solvent complying with P-D-680. According to Safety Kleen's MSDS for this substance, it contained **tetrachloroethylene**. See pages 1, 7, 9 ("Based on the ingredients listed in SECTION 2, this product contains the following "hazardous substance" listed under . . . CERCLA, . . . Perchloroethylene").
October 21, 2005	Safety-Kleen 105 Solvent Recycled	See discussion of 2002 MSDS for the same substance. The 2005 MSDS states that this contained **tetrachloroethylene**. *See* pages 2, 9, 11.
October 13, 2008	Safety-Kleen 105 Solvent Recycled	See discussion of 2002 MSDS for the same substance. The 2008 MSDS states that this contains **tetrachloroethylene.** *See* pages 3, 13.